PROBLEMS FOR SOLUTION.

ALGEBRA.

298. Proposed by J. F. LAWRENCE, A. B., Professor of Mathematics, Stillwater, Okla.

If α, β, γ, ..., are the roots of the equation $\sin mx - nx \cos mx = 0$, prove that $\tan^{-1}\frac{x}{\alpha} + \tan^{-1}\frac{x}{\beta} + \ldots + \tan^{-1}\frac{x}{\nu} = 0$.

GEOMETRY.

331. Proposed by DAVID F. KELLEY, New York, N. Y.

To find the area of a parabolic sector, by a hitherto unpublished method.

CALCULUS.

255. Proposed by A. H. HOLMES, Brunswick, Maine.

Evaluate $\int_0^{\frac{1}{2}a} \frac{dx}{\sqrt{[2ax - x^2\sqrt{(a^2 - x^2)}]}}$.

256. Proposed by PROFESSOR R. D. CARMICHAEL, Anniston, Ala.

Solve the differential equation, $(1+y+2xy)dx + x(1+x)dy = 0$.

MECHANICS.

215. Proposed by HENRY WRITT, Genoa Junction, Wisconsin.

Suppose two centers of attractive forces A and B having a ratio 1 : 330,000, and influence reducing as the second power of the distance, *i. e.*, R^{-2}. Then there is a point, P, on the line joining A and B, where $\frac{1}{AP^2} = \frac{330{,}000}{BP^2}$, or 1 : 575, nearly. At this point the attractions are equal but opposite in direction along AB. It is proposed to find the surface through the point P which is the locus of the direction of the resultant of the two forces directed towards A and B, *i. e.*, the locus of the diagonals of the minimum parallelogram of forces.